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ABSTRACT

This study investigated what and how preschool children view children's television programs, with a focus on cultural and ecological factors which might affect their visual attention and the nature of their immediate recall of content. The secondary task method (in which an individual is required to perform two tasks simultaneously) was applied to determine children's attention degree, and an in-depth interview was conducted to describe the subject's memory type. Subjects were 60 kindergartners in Taiwan. An edited segment from a Chinese pre-school television program was used as the primary source of information. In addition to the video, a set of color transparencies were used as the secondary task instrument. Both stimuli were 16 minutes in length. In total, 12 observation sessions were conducted. Age difference, demographic area, and language familiarity were found to be significant factors that affect children's attention on television viewing. (Contains 21 references.) (AEF)

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Factors Affecting Children's Attention on TV Viewing

by Sophia T. Wu

Abstract

This study was conducted to investigate what and how pre-school children attend to children's TV programs. The secondary task method was applied to determine children's attention degree, and an in-depth interview was conducted to describe subject's memory type. Age difference, demographic area, and language familiarity were found to be significant factors that affect children's attention on TV viewing.

Introduction

For many decades, children's TV programs have been considered educational and expected to be an essential learning vehicle. The positive effects of children's TV programs have been investigated and demonstrated in a good deal of research articles (Welch & Watt, 1980; Howe, 1983, Mielke, 1990). Among the variables tested to be influential factors affecting learning outcome, attention has been investigated from many aspects and thought to be a critical pre-requisite leading toward content comprehension. Houston and Write (1983) suggest that fast-paced, high volume, special effects on audio and video track, etc. are elements that contribute to the unique format of children's TV programs. Such standard attributes then serve as attention cues which will direct children's attention (Cohen & Salapatek, 1975). Salmon (1977,1979) points out that in addition to the program content, the convention of TV language, such as camera movement and editing style, affect the activation of cognitive strategy of the audience. Furthermore, media perception, also known as AIME (amount of invested mental effort, proposed by Salmon, 1981;1983), is one of the factors that influences the amount of learning from TV. Investigating the influence of visual complexity on children's attention to children's TV programs, Welsh and Watt (1980) found that children's attention was positively associated with content recognition. In general, it is agreed that attention is one of the most predictive factors affecting the educational effect of children's programs.

Some of the recent studies on attention have shifted the research paradigm to the concept of "active viewer". Children are no longer passive objects waiting for information to swallow in without discrepancies. From mass culture theory, TV programs are products of cultural practice and ecological structure. Thus, macro factors, such as the culture and ecology related to the cultivation of a child, need to be explored in order to better understand how children react to TV content. In addition to the reflecting on the impact of social context on the audience, data collection from content analysis or experimental research design alone appears to be inadequate in interpreting the multi-facets of children's TV viewing behavior. Overall, experimental and quantitative statistical figures do help researchers understand "what" children focus on while watching TV. However, the more complete picture is still at large due to the lack of the qualitative data on "why" and "how" children are attracted to certain information. The present study attempts to fill the incomplete puzzle from different angles.

Method--The Secondary Task Method

Based on Kahneman's definition of operation, attention is defined as mental effort allocated to performing cognitive tasks. As the result of resource limitation of cognitive capacity, it is assumed that when much effort is assigned to one task, such as viewing television, performance on a concurrent task suffers (.Kahneman, 1973; Meadowcroft, 1996). According to Meadowcroft, an implication of Kahneman's theory is that attention can be measured as mental effort by a secondary task method that requires individual to perform two tasks simultaneously. Attention is associated

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with program appeal, which would lead to comprehension.

The purpose of the study was to investigate cultural and ecological factors which might affect children's visual attention to TV viewing and the nature of their immediate recall of content. The research design, including variables, subjects, stimuli, and procedures is described below.

Independent and Dependent Variables

Demographic variables such as gender, age, and living area were treated as independent variables. Age variable was devided into two levels: the 5-year-olds and the 6-year-olds. There were two categories of living area: urban and rural location. Attention index, the main dependent variable, was measured according to the observed record, which will be described in detail in the procedure section.

Another dependent variable, recall and the cues of recall, was not quantitatively defined, instead, qualitative data was collected through in-depth interview.

Subjects

Subjects were recruited from two kindergartens, one of which was located in the Taipei metropolitan area, the other was from a southern town—Tainan in the south of Taiwan. There were a total of 60 subjects, 30 of which were 5-year-olds and 30 were 6-year-olds. In addition to the age variable, half of the subjects were from the city and the other half, from the south. Details of the demographic information of subjects is shown in Figure 1.

Figure 1

Subject Demographic Data

Gender	
boy	n=30
girl	n=30
Age	
5-year-old	n=30
6-year-old	n=30
Living area	
Urban	n=30
Rural	n=30
Total	N=60

Stimuli

An edited segment from a Chinese pre-school TV program named "Popcorn" was used as the primary source of information. In addition to the video, a set of color transparencies copied from a colorful children's book were used as the secondary task instrument. Both stimuli were 16 minutes in length.

Procedures

Each kindergarten had five trained observers for each section. In total, 12 observation sessions were conducted. Each one observer went into a class to observe one child who was selected randomly beforehand. In other words, among 20 or so children, there were only five of them who were being observed in each session. Subjects did not know they were being observed.

After setting up the video, a technician showed the transparencies by replacing one every 15 seconds. Indication of watching TV, or looking at the transparency, or doing other activities were marked by the observer every 15 seconds for each child for a 16 minute period.

After reviewing the video, a semi-structure in-depth interview was conducted individually to collect recall data.

Results

Children's TV viewing attention was observed by the researcher and observers on a one-to-one basis. Figure 2 presents the percentage of children who focused on the TV screen at each moment of observation. It is noted that the visual contact with TV during the 19th to 21st period was about 50%, compared with other periods such as the 33rd to 38th, whose contact rate was higher than 98%. The variation of TV attention of children throughout the period of video viewing could be visualized when the percentage figures were computed and transformed into a chart. As shown in Figure 3, some time periods attracted more attention than the others.

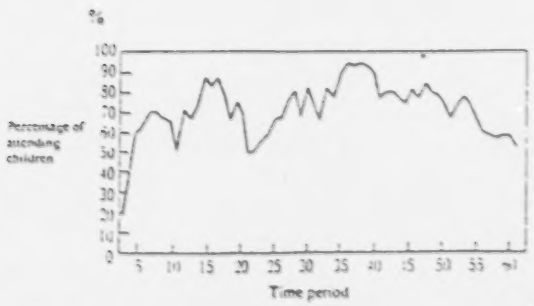
Figure 2

Percentage of TV Attending of Children

Time period	n	%
1	21	35.0
2	35	58.3
3	37	61.7
4	42	70.0
5	42	70.0
6	40	66.7
7	39	65.0
8	30	50.0
9	43	71.7
10	40	66.7
11	45	75.0
12	53	88.3
13	50	83.3
14	53	88.3
15	48	80.0
16	40	66.7
17	46	76.7
18	42	70.0
19	30	50.0
20	31	51.7
21	34	56.7
22	36	60.0
23	41	68.3
24	42	70.0
25	47	78.3
26	50	83.3
27	42	70.0
28	51	85.0
29	46	76.7
30	41	68.3

Figure 3

TV Attention of Children in the Observation Period



It should be noted that gender difference was not found; however, age difference was discovered in the amount of visual contact of TV. Figure 4 offers an interpretation of age difference during the observant period. The average time focusing on TV for the 6-year-old children was 11.98 minutes, and 10.23 minutes for the 5-year-olds respectively (t = 2.25 *). Significantly, 6-year-olds are more capable of holding their attention than 5-year-olds in average. It is graphically demonstrated in Figure 5.

Figure 4

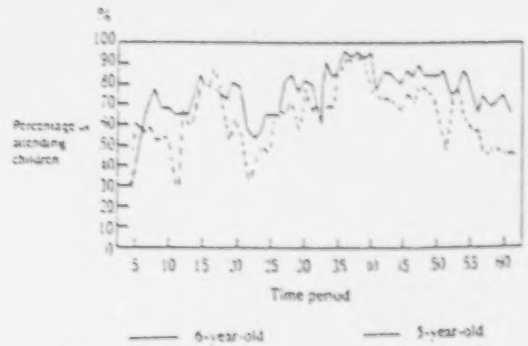
Mean Difference of Attending Time of Various Source Between Age Groups

Age / Attention direction	6-year-old (N=30)	5-year-old (N=30)	T value
TV screen	M=11.98 SD=2.91	M=10.23 SD=3.14	2.25 *
Transparency	M=1.90 SD=1.73	M=2.70 SD=2.07	-1.62
Other activity	M=1.12 SD=1.55	M=1.68 SD=1.66	-0.40

*P<0.05

Figure 5

Comparison of TV Attention of 5-year-old and 6-year-old Children



Attention gap between children from urban and rural area was statistically significant. T-test showed urban children were more attracted to TV than rural children were. In average, rural children spent 9.58 minutes in

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viewing video, while urban children spent 12.63 minute (t = -4.28 ***). By the same token, rural children spent more time on watching transparencies and doing other activities than urban children did (see Figure 6). Figure 7 also supports the above finding that children from urban area were more capable of holding attention toward video than their counterparts.

Figure 6

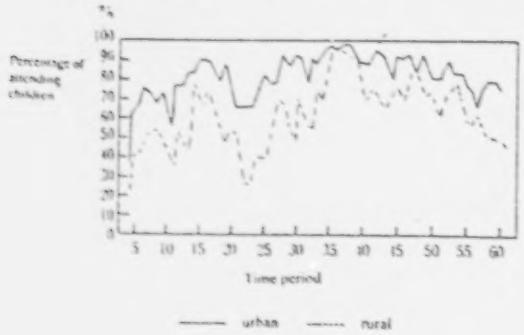
Mean Difference of Attending Time of Various Source Between Living Areas

Living area / Attention direction	Rural (N=30)	Urban (N=30)	T value
TV screen	M=11.98 SD=2.91	M=12.63 SD=2.06	-4.28 ***
Transparency	M=3.15 SD=2.14	M=1.45 SD=1.25	3.76 ***
Other activity	M=2.27 SD=1.95	M=0.93 SD=1.12	3.27 **

P<0.05 ** P<0.01 *** P<0.001

Figure 7

Comparison of TV Attention of Urban and Rural Children



Two-way ANOVA was computed for further investigation of whether interaction exists in living area and age variable. As shown in Figure 8, no interaction was found between age and living area. Children from rural areas showed less interest in TV viewing regardless of their age.

Figure 8

Two-way ANOVA Table Summary

Source of variance	SS	DF	MS	F-ratio
Main effects	185.15	2	92.58	13.179***
Age	46.38	1	46.38	6.60*
Area	138.78	1	138.78	19.76***
Interaction	0.38	1	0.38	0.05
Variance explained	185.53	3	61.84	8.80***
Residuals	393.38	56	7.03	
Total	578.911	59	9.81	

* P<0.05 ** P<0.01 ***P<0.001

Qualitative data was collected from in-depth interviews to gather information regarding what and how children recall video content. Textual analysis was applied in order to determine what content or form might invite viewing attention. Based on the interview transcripts, recall were categorized into two dimensions: visual memory and audio memory, under which description of memory cue (reason why they remember certain content expressed by the subject) was recorded. Under visual memory, there were four items including character(man, woman, puppet, etc.), acting, and setting (props, dress, etc.). Dialogue and effect were categorized as analyzing items of audio memory. In general, children remembered moving images better which were post-produced with special effects (such as slow motion), or segments with saturated visual in action. Such findings were supported by Figure 3, Figure 5, and Figure 7, statistically from previous discussion.

In addition, children had better memory of animal character over human character, and female character was better remembered than male character was. It seems that gender (or human being) identification has not yet developed for 5 and 6-year-old children. The researcher found that children in general were attracted by "moving visuals" or saturated visual codes, which usually accompanying by animation or special effects. On the contrary, talking heads or even dialogues between puppets were less powerful in inviting children's attention.

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Discussion

The findings indicate that when watching TV programs, the pre-school children were more attracted to visual segments with moving images than static ones. However, further investigation shows that significant differences exist in age, and urban and rural factors. Relatively speaking, younger children and rural children were less attracted by TV programs. Furthermore, data from in-depth interviews points out that much of the recall was related to the form which the information was encoded in a visualized way; that is using special effects or characters in action. Reasonable inference for the fact that rural children pay less attention to the video which may result in registering less information is due to language difficulty. Mandarin Chinese is the official language for most of children's programs in Taiwan. However, Taiwanese is one of the most popular dialects spoken for many children who live in rural areas. For rural audiences, language difficulty became one of the obstacles which affected their understanding of the content and their interest or attention would fall with the viewing process.

As far as the audio memory concerns, to the researcher surprise, sound effects did not seem to play an essential role of memory cue. It is even more evident particularly when visual code was dominating the information process. For example, in the video, 98% of children were attracted by the segment that one of the main characters was covered by a banana skin by using reverse special effects. At the time, very few children recalled special sound effects laid along with the visual action.

Conclusion and Implications

The study presented evidence regarding what children focus on and what and why they recall from viewing children's TV programs. The findings contribute to the body of knowledge of how children's attention differ by age group as well as living area. From a developmental psychological point of view, one year apart for the 5-year-old and 6-year-old may not show cognitive significant difference. However, from the result of the study, it is clear that older children have better attention span toward televised messages. Another possible explanation for this, is that the content of the program was more suitable for older children. In either case, the concept of age difference has narrower definition than what is being practiced now. This finding should help to enlighten TV children program producers to the fact that age difference needs to be redefined.

Similar to many other countries, in Taiwan, the production of children's program is usually nationwide. In other words, there is only one version that circulates throughout the entire island. However, the qualitative data in this study shows that if the language used in a program is different from the language used by the target audiences, a negative effect toward attention casting results. This issue has never been raised before to TV producers or the public. The study suggests that the language used in a program should be recognized as an important factor that affects children's attention span.

The ecology of the living area seems to have great impact on children's attention and interest. Children who are familiar with a rural environment demonstrate less attention span to the video containing content and format mainly from an urban atmosphere. It is evident that children are attracted to things and settings with which they can associate or identify.

In conclusion, the findings from the preliminary study raise cultural and ecological dimensions that affect audience's reception of TV messages. More efforts is needed to understand the holistic picture of children's TV viewing context—psychologically, socially, culturally, and ecologically.

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